

DOCUMENT RESUME

ED 170 502

CE 020 223

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TITLE Project CERES. Ceres Unified School District, Ceres, California. A Submission to the Joint Dissemination Review Panel.
INSTITUTION American Institutes for Research in the Behavioral Sciences, Palo Alto, Calif.
SPONS AGENCY Office of Career Education (DHEW/OE), Washington, D. C.
REPORT NO AIR-66700-4/78-TR1 (6)
PUB DATE 30 Apr 78
CONTRACT 300-77-0303
NOTE 11p.; For related documents see ED 162 103 and CE 020 214-215

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Articulation (Program); *Career Development; *Career Education; Curriculum Development; Educational Finance; Educational Objectives; Elementary Secondary Education; *Evaluation Methods; Program Costs; Program Development; *Program Effectiveness; *Program Evaluation; Program Validation; Validated Programs
IDENTIFIERS *Project CERES

ABSTRACT

One of seven career education programs chosen for nationwide dissemination by the Department of Health, Education, and Welfare's Joint Dissemination Review Panel (JDRP), Project CERES (Career Education Responsive to Every Student) is being conducted for grades K-6 with planned expansion to grades 7-12. For the years 1972-76, it received funding from federal grants. In order to infuse career education concepts into the elementary and secondary curriculum and to develop an articulated curriculum that would provide for student attainment of career education goals, project staff developed a Career Education Matrix to establish instructional goals, student objectives, and staff responsibilities. Ten areas of career education are covered by the Matrix: career awareness, self awareness, career preparation, educational awareness, career planning and decision making, attitude development, economic awareness, career orientation, consumer competencies, and career exploration. To evaluate the project's effectiveness, the Primary and Intermediate Career Objectives Tests were administered in 1973-74 to sixteen elementary classes evenly divided between treatment and control groups. Based on the significantly higher scores of the treatment groups, it was concluded that the project produced educationally meaningful results in career education. (The review process that this and the other six projects underwent prior to JDRP submission and approval is described in CE 020 214-215.) (LIG)

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PROJECT CERES

Ceres Unified School District
Ceres, California

A Submission to the
Joint Dissemination Review Panel

Octave V. Baker
American Institutes for Research

30 April 1978

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
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ED170502

CE 020 223

PROGRAM AREA: Career Education

ACTIVITY TITLE, LOCATION: Career Education Responsive to Every Student
(Project CERES), Ceres, California

DEVELOPED BY: The intervention was developed by personnel of the Ceres Unified
School District

SOURCE AND LEVEL OF FUNDING: Funds for the first three years of the project (1972-1975) were provided by a Vocational Education Part D grant. Funds for a fourth year were provided by an Incremental Improvement in Career Education grant administered through the Office of Career Education. The level of funding is as follows:

<u>Grant Period</u>	<u>Level of Funding</u>
1972-73	\$200,000
1973-74	200,000
1974-75	200,000
1975-76	174,000
	<u>\$774,000</u>

YEARS OF ACTIVITY DEVELOPMENT: 1972-1975

BRIEF DESCRIPTION OF ACTIVITY

Purpose

The project is a three-year research and development effort with the dual purpose of infusing career education concepts into the elementary and secondary curriculum and of developing an articulated curriculum that provides for student attainment of career education goals. The project staff has revised previously existing course guides to facilitate the infusion of career education concepts into the regular curriculum. They have also developed a "Career Education Matrix" that sets forth the instructional goals, student objectives, and staff responsibilities at the various grade levels. A strong in-service education program has been basic to the development of all activities.

Background

The Ceres career education program was developed in response to several concerns shared by teachers, administrators, and parents in the district. These groups believed that many young people were ending their education without saleable skills and without a positive orientation toward the world of work. The young people also appeared to lack training that would equip them to cope with a job market increasingly characterized by technological advances in agriculture, business, and industry. Local employers, for example, were concerned that many young people were unable to demonstrate basic skills in reading, writing, and computation with an acceptable degree of mastery. They believed that the situation could be improved if students were taught in school why basic skills are needed for success in the job market. With over 70% of all students in the district terminating their school attendance at or before the 12th grade, the problem of inadequate preparation of young people for the world of work was acute.

In response to these needs, the staff of the district began to develop the CERES comprehensive career education program with the overall goal of preparing students to successfully enter the world of work. The program was developed after a thorough examination of a wide range of alternatives. The process of program development included several teacher workshops, a staff survey, and the formation of several task

forces, each charged with the development of one aspect of the program. The District Board of Trustees formally adopted career education as a district-wide policy in 1972.

Goals and Objectives

All project activities are guided by the "Career Education Matrix." This document contains the career education goals and student outcome objectives in ten areas of career education for the primary, intermediate, junior high, and high school levels. It also outlines the program components for administration, vocational education, and in-service aspects of the program. The goals and objectives set forth in this document are derived from definitions provided by the Career Education Task Force of the California State Department of Education and by the United States Office of Education. The ten areas of career education contained in the matrix, the associated goals, and sample performance objectives are as follows:

1. Career awareness: Students will develop and demonstrate a continuing awareness of career opportunities and relate them to their aptitudes, interests, and abilities.
Sample objective: The student will describe five jobs chosen from two or more career clusters and will identify clusters which best fit his/her abilities and aptitudes.
2. Self awareness: The student will develop a positive attitude toward self and others, a sense of self-worth and dignity, and motivation to accomplish personal goals.
Sample objective: The student will identify three or more positive qualities in himself or in classmates.
3. Career preparation: The student will acquire skills leading to entry-level employment in one or more careers with provision for advanced training.
Sample objective: The student will be able to successfully complete three different types of job application forms, complete a resume, demonstrate acceptable procedures for participating in a job interview, and list eight sources for finding job openings.
4. Educational awareness: Students will recognize that their educational experiences are part of their total career preparation and development.
Sample objective: The student will be able to identify skills needed for jobs and to tell where in school the skills are learned.
5. Career planning and decision making: Students will increase their self-knowledge and their knowledge of societal effects on the world of work and will accept responsibility for career choices compatible with their desired life-style.
Sample objective: The student will successfully complete a fill-in questionnaire on decision making.
6. Attitude development: Students will develop a positive attitude toward work and leisure time activities, appreciate their contribution to self-fulfillment and to the welfare and productivity of the family, the community, the nation, and the world.
Sample objective: The student will list jobs, relate them to human needs, and list jobs that will give him/her a feeling of self-worth.
7. Economic awareness: Students will understand the economic systems of our society, the relations of productive work to the economy and to their own economic well-being.
Sample objective: By the end of the primary experience, given a list of occupations, the student will be able to determine whether the occupation produces goods or services.

8. Career orientation: Students will participate in Career Orientation Activities that will increase their exposure to the options available to them in the world of work.
Sample objective: Through Career Orientation Activities, students will be able to list job opportunities within a 75-mile radius of Ceres.
9. Consumer competencies: Students will achieve sufficient economic understanding and consumer competencies to make wise decisions in the use of resources -- both personal and communal.
Sample objective: By the end of the intermediate level, students will be able to compare and contrast products in terms of price, quality, packaging, utility, and personal preference.
10. Career exploration: Students will plan and participate in a program of career exploration that will contribute to their personal and career satisfaction.
Sample objective: Students will demonstrate increased awareness of which jobs will meet their various interests.

CLAIMS OF EFFECTIVENESS

Claims of effectiveness are being made for Project CERES at the primary (K-3) and the intermediate (4-6) grade levels. At these levels the project has successfully infused career education concepts into the general curriculum in the district. It has also developed an articulated curriculum that provides direction for students in several areas of career education. In sum, the project has developed, implemented, and evaluated a comprehensive, sophisticated career education program that is replicable by other districts across the nation.

Attainment of student outcome objectives was assessed by use of an evaluation design consisting of comparable treatment and control groups. When compared with the control group, treatment students showed significant growth in their career development as reflected in their achievement of objectives representing the ten areas of career education outlined above. Student growth was measured by a project-developed career education test, which was administered and scored under conditions that ensured objectivity.

Context and Intended Users

The Ceres school district is located in Stanislaus County, which is in the heart of the Central Valley of California, one of the nation's great agricultural regions. The principal income in the county is from the production of goods. The population of this county on January 1, 1974, was estimated to be 210,400, a rank order of 30th in the state. The Ceres Unified School District enrolls approximately 4,500 pupils in grades K-12 in five elementary schools, one junior high, one high school, one small continuation high, and a school for the aurally handicapped. Family income within the school district is frequently described as modest. Most families are said to fall within lower and middle socioeconomic classifications. Blacks and Mexican-Americans comprise about 12% of the population. Approximately 3% of the families in the district are migrant farm workers. It is expected that the career education project will be suitable for school districts with a similar socioeconomic and ethnic composition.

Activity Description

Grade levels, years of operation. The project began in 1972 and is currently in operation in grades K-6.

Staffing. The project operates within the framework of the existing school staffing arrangements. Accordingly, it does not require changes in regular staffing assign-

ments, duties, or procedures. To replicate the project most school districts would probably have to hire a part-time coordinator and a part-time clerical person to duplicate materials.

Facilities. Since the major focus of the project is on infusing career education concepts into the regular curriculum, the project can operate in a regular classroom without any special modifications.

Scope of the project. The Ceres project has six components which provide the organizational structure needed for implementation of the project. The general nature of each component is described below.

1. Administration. This component provides for selection of staff, leadership, comprehensive detailed planning of the effort, general supervision of project staff, community awareness and involvement, and budget management.
2. Elementary Curriculum and Inservice. This component provides for the development, implementation, and evaluation of the K-6 curriculum model. In-service education of elementary teachers and building principals in the general and specific concepts of career education and the development of units of study for the K-6 grades fall within this component.
3. Guidance. This component provides for the amalgamation of the guidance services in the Ceres District into a coordinated and comprehensive effort. Responsibilities for guidance specialists and guidance by teachers is indicated within the Career Education Matrix. Particular reference is made to the achievement of a "guidance attitude" on the part of all staff.
4. Media Center. This component provides for the printing of all career education materials being developed in the project and for the teaching of the printing and graphic arts.
5. Parent-Community Involvement. The project has provided for considerable involvement of the community in the planning, implementation, and information dissemination efforts. Community members from labor, industry, business, and parent groups participate on advisory boards and as experts in defining the current requirements for various careers. The project has sought to publicize and disseminate career education concepts through newspaper accounts, project mailings, and public appearances. The community response to career education is described as excellent and there appears to be considerable support for the concept of career education.
6. Instructional Materials. The project has emphasized not only the development of curriculum models and objectives for career education but also the production of materials to implement or provide for the teaching of the curriculum. Over 100 Learning Achievement Packages and other instructional materials have been developed and field-tested. A variety of commercially available materials is used to supplement the locally developed materials.

To illustrate the progress of a student through the Ceres Career Education Curriculum, the following description is given as a typical student experience. The primary (K-3) classes begin with a two-week Self-Awareness Unit designed to assist students in learning about themselves, their schools, and their families. Following the Self-Awareness Unit, Learning Centers are introduced into the classrooms. The Centers, designed by the teachers, provide students with the opportunity to learn about the characteristics of a wide variety of careers. The curriculum also includes career simulation games, study trips, and presentations by community resource persons to develop awareness of many types of jobs available in the world of work. All teachers are aware of the student goals and objectives presented in the Career Education Matrix

and it is expected that the impact of the group experiences will lead to the achievement of the objectives.

At the intermediate (4-6) levels, teachers also begin with Self-Awareness Units. They use career interest centers similar to those at the primary level. Additionally, the students visit work sites in the community to increase their knowledge of jobs, to develop positive attitudes toward work, and to relate the world of work to school.

Costs

The costs associated with replicating the project are presented in the chart below. Note that the figures do not include any developmental costs. All costs are presented in terms of a unit, i.e., one teacher and 30 students.

	Level of Funding	
	Installation (Non-Recurring Costs)	Subsequent Years (Recurring Costs)
Personnel		
Coordinator	\$ 200 per unit	\$200
Clerical	50 per unit	50
*Personnel Training (30 hours per unit)	300 per unit	0
*Consultant (for technical assistance; three days per unit)	375 per unit	0
Facilities	0	0
Materials	100 per unit	50
Consumables	25 per unit	25
Transportation (for field trips)	150 per unit	150
Public Relations	8 per unit	0
Totals:	\$1208 per unit	\$475

EVIDENCE OF EFFECTIVENESS

Evaluation Design

The evaluation was conducted by the staff of the project with the assistance of an outside research specialist. Project staff also received occasional consultation from the Career Education Task Force of the California State Department of Education. From the project's inception evaluation has focused on student attainment of project objectives (outcome evaluation) and on the staff's achievements in implementing the project's components (process evaluation). The latter has taken the form of stating the events that indicate project implementation and providing the documentation necessary to assure the project director, or others, that the events had occurred. In this way, objectives and evaluation strategies were developed for all components of the project including administration; elementary curriculum development and in-service; community involvement; guidance; and the media center.

As for outcome evaluation, the project staff developed an extensive evaluation design for each year of the project to assess student attainment of objectives in each of the ten areas of career education previously discussed. The discussion that follows

* These costs can be substantially reduced by conducting training with groups of teachers.

is concerned with the outcome evaluation of student achievement conducted during the 1973-74 school year for grades K-6. The evaluation design utilized pre- and posttests on treatment and control groups. The 1973-74 school year was selected as a focus here because during subsequent years almost all teachers in the district were teaching career education in some form. Thus, it was difficult to identify a control group in the subsequent years that had not been exposed to career education concepts.

Four of the five district elementary schools were represented in the evaluation sample in 1973-74. Treatment group students were randomly selected at each school from classes of teachers who volunteered to take part in the project. Four primary (grades K-3) and four intermediate (grades 4-6) classes received the career education treatment. Five primary and four intermediate classes served as control groups for the evaluation. These teachers also volunteered to participate in the evaluation. Every attempt was made to reduce the possibility of teacher selection bias. Thus, school principals were asked to identify and select teachers to participate in the control group who were just as enthusiastic and committed as the teachers in the treatment group. The treatment and control classes were closely matched in terms of sex composition, academic achievement, age, and ethnic composition. Tables 1 and 2, presented below, show how the treatment and control groups scored on the project-developed pretests.

The pretest mean scores in Table 1 show that the control group was initially superior to the treatment group at the primary (K-3) level; however, the difference is not significant. At the intermediate level shown in Table 2, the treatment group was significantly superior to the control group on pretest scores. This fact led to the analysis strategy, discussed below, of examining the treatment effect among sub-groups of the intermediate sample that were equivalent on pretest scores.

Table 1

Mean Pretest Scores of Primary (K-3) Treatment and Control Groups
on the Careers Objectives Test (PCOT)

Treatment			Control			t
N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	
58	12.3	8.0	55	14.7	8.2	1.6 (n.s.)

Table 2

Mean Pretest Scores of Intermediate (4-6) Treatment and Control Groups
on the Careers Objectives Test (PCOT)

Treatment			Control			t
N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	
62	20.5	8.9	63	14.7	7.9	3.86*

* Significant at .001 level, one-tailed test, d.f.=123

Interpretability of Measures

The Primary Career Objective Test (PCOT) and the Intermediate Career Objectives Test (ICOT) were used to assess the achievement of the treatment and control groups. Test development began by a close examination of the project objectives, from which the project staff derived a pool of items. Items were aimed specifically at the program's objectives. The items were pilot-tested on several classes at a local school

and revised. The major concern at this stage of the development process was to formulate questions that were understandable and appropriate for the students, that addressed the project's objectives, and that discriminated treatment from non-treatment students. Since the evaluators were primarily interested in testing students in the achievement of career education objectives, not in basic skills, the decision was made to use a structured interview format for administration of the tests. The PCOT contained seven questions related to the program objectives. The ICOT contained ten questions. The items closely reflected the Career education goals and objectives discussed earlier.

Credibility of Evidence

The PCOT and ICOT were individually administered to the 1973-74 treatment and control students by a team of students from the Argus Continuation High School in October 1973 (pretest) and May 1974 (posttest). The high school students were given training in the administration of the instrument, and they were not aware which subjects were in the experimental or the control group. All students were thoroughly instructed in procedures to make the conditions of the interview as consistent as possible. Tests were scored by resource teachers and substitute teachers under the supervision of the project staff. Data analysis was conducted by a consultant retained by the project. It thus appears that test administration and scoring were conducted under conditions that reduced bias to a minimum.

Evidence of Impact

Student achievement was assessed by comparing the posttest scores of the control group with the posttest scores of the treatment group. The t -test for independent groups was used to analyze the mean group differences on the posttest. Tables 3 and 4 below present the results of the analysis.

Table 3
Mean Posttest Scores of Primary Treatment and Control Group
on Primary Test of Career Objectives (PCOT)

<u>Treatment</u>			<u>Control</u>			<u>t</u>
<u>N</u>	<u>$\bar{X}$</u>	<u>S.D.</u>	<u>N</u>	<u>$\bar{X}$</u>	<u>S.D.</u>	
57	22.3	14.9	55	14.9	7.7	3.30*

* Significant at .01 level, one-tailed test, d.f.=110

Table 4
Mean Posttest Scores of Intermediate Treatment and Control Groups
on the Career Objectives Test (ICOT)

<u>Treatment</u>			<u>Control</u>			<u>t</u>
<u>N</u>	<u>$\bar{X}$</u>	<u>S.D.</u>	<u>N</u>	<u>$\bar{X}$</u>	<u>S.D.</u>	
56	32.3	10.3	56	24.4	10.1	3.95*

* Significant at .001 level, one-tailed test, d.f.=110

As shown in Tables 3 and 4, the mean posttest scores of the treatment groups are significantly higher than the mean posttest scores of the control group. Note that the control group mean pretest score at the primary level was superior to that of the treatment group; this situation was reversed on the posttest, with the treatment group scores exceeding those of the control group by a wide margin. As noted earlier, however, the treatment group at the intermediate level was superior to its control group on the pretest. Thus, one cannot be certain that the posttest differences at the intermediate level are in fact attributable to the treatment. At the primary level, of course, the posttest differences can reasonably be attributed to the treatment, since the treatment and control groups were not significantly different on the pretest.

To assess more definitively the effect of the treatment at the intermediate level, the evaluators sought to identify sub-groups with comparable pretest scores. To this end, they examined the pretest scores of the middle and lower socioeconomic sub-groups. (Socioeconomic level was determined by economic, cultural, and educational achievement criteria established by the California Department of Compensatory Education.) The evaluators found no significant differences between the pretest scores of the treatment and control groups among the lower socioeconomic students. See Table 5.

Accordingly, among the lower socioeconomic students at the intermediate level a more valid assessment of the treatment effects could be conducted. Table 6 shows the mean posttest scores of the treatment and control groups among the lower socioeconomic students.

Table 5

Mean Pretest Scores of Lower Socioeconomic Intermediate Treatment and Control Students on the Career Objectives Test (ICOT)

<u>Treatment</u>			<u>Control</u>			<u>t</u>
<u>N</u>	<u>$\bar{X}$</u>	<u>S.D.</u>	<u>N</u>	<u>$\bar{X}$</u>	<u>S.D.</u>	
31	18.5	11.0	32	16.9	7.9	.66 (n.s.)

Table 6

Mean Posttest Scores of Lower Socioeconomic Intermediate Treatment and Control Students on the Career Objectives Test (ICOT)

<u>Treatment</u>			<u>Control</u>			<u>t</u>
<u>N</u>	<u>$\bar{X}$</u>	<u>S.D.</u>	<u>N</u>	<u>$\bar{X}$</u>	<u>S.D.</u>	
31	32.6	12.7	27	27.8	8.3	1.70*

*Significant at the .05 level of confidence, one-tailed test, d.f.=56

As can be seen, the mean of the treatment group is significantly higher than that of the control group on the posttest. Thus, one can conclude that the treatment had a significant impact at the primary level and at the intermediate level with respect to the lower socioeconomic students.

Comments

The research design utilized in the evaluation allows one to plausibly attribute the observed posttest differences between treatment and control groups to the career education treatment. The treatment and control groups were closely matched in terms

of sex, academic achievement, age, and ethnic composition. The educational experiences of the groups were similar except for the fact that the treatment groups were exposed to the career education program. The use of a comparable control group allows one to rule out extraneous variables such as history, practice effects, and maturation effects as being responsible for the results. In addition, teacher effects can probably also be ruled out as an explanation of results since the control group teachers were as enthusiastic and dedicated as those in the treatment group.

The evaluation provides reasonable evidence that Project CERES produced educationally meaningful results. The level of statistical significance obtained indicates that the results were not a result of chance. The gains of the treatment group were large, exceeding those of the control group by a range of over one standard deviation at the primary level to one-third of a standard deviation among lower socioeconomic intermediate students. Moreover, the gains are in areas important to career education. Additionally, the materials, curricula, and practices of the project can easily be adopted elsewhere with minimal cost.